56. The method of fluid distribution of claim 47, including a step of utilizing ceramic filter units having a minor axes of 0.5 inches to 3 inches.

INFORMATION DISCLOSURE STATEMENT

The Examiner requested more information regarding a document that was cited on the IDS as cite no. DT, "Criterion, Top Bed Catalysts and Support." The document is available from Criterion's website at http://www.criterioncatalysts.com/html/topbed2.html. The document is part of Criterion's sales information. No publication dates are provided on the website for the document entitled "Top Bed Catalysts and Support." The document was available at least as of the date the IDS was filed, which was on November 11, 1999. Additional information is available on Criterion's website for the 855 MD (Medallion) product, which would be considered within the scope of the present invention. 'Product Bulletin: Criterion* 855 MD "Medallions" Inert Catalyst Support' is the title of the document, a copy of which is now being provided. The publication date for this document is August 1998.

The filing date of the provisional application to which this application takes claim to is May 29, 1998. Since the filing date of the provisional application is prior to the disclosure of the information on Criterion's website and the publication of the product bulletin for 855 MD, disclosure of this information through these two publications are not prior art.

THE REJECTIONS

Claims 46 – 52 were rejected under the provisions of 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Claims 46 – 52 were rejected under the provisions of 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

Claims 46, 47, 49, 51, and 52 were rejected under the provisions of 35 U.S.C. § 102(b) as allegedly being anticipated by German patent DE 35 39 195 to Hung, et al (hereafter the "Hung Patent").

Claims 48 and 50 were rejected under the provisions of 35 U.S.C. § 103(a) as being allegedly unpatentable over German patent DE 35 39 195 to Hung, et al (hereafter the "Hung Patent").

THE REFERENCE

The Hung patent (page and line numbers refer to the English language translation) "concerns hydroprocessing or hydrotreatment catalyzers which... comprise extrudates with a cross-section that is oval and has two holes therein." (p.2, ll. 1-4). The catalyzers have openings therein "which are circular or oval" (p. 9, ll. 6-7), with "oval" being defined as shapes with two areas of relatively great curvature separated by two areas with relatively less curvature should also be comprised therein." (p. 8, ll. 15, 16-18).

Response to 35 U.S.C. §112, First Paragraph Rejection

Applicant agrees with the Examiner's reading of the "Beyond the Ellipse" definition for a trisoid being a curve that results when the total distance from three given points is kept constant. The primary focus of supplying the Examiner with this article was to provide a pictorial representation of what a trisoid looks like. Figure 14 of the present application has the same shape as the example trisoid in the "Beyond the Ellipse" article. The desired shape, for the openings that are called "trisoids" in the specification, is a triangle with radially rounded edges, so that there are no pointed edges in the openings. Applicant submits that there is adequate support in the specification to allow the use of the shape, since a pictorial representation is provided with Figure 14. Additionally, this pictorial representation was included in the originally filed application. The definition was available to the public as of September 2, 1996.

With respect to claim 48, the Patent Examiner stated that the limitation "having a size of 0.5 to 3 inches" was unclear and there did not appear to be support in the specification for this limitation. Claim 48 has been amended and claims 53 through 56 have been added. Support for

the amended claim 48 can be found on page 6, lines 13 – 14 ("may include sides having lengths of about 1/8 to 3 inches."). Support for the added claim 53 can be found on page 6, lines 14 – 15 ("substantially circular cross-sectional configurations of about ¼ to 3 inch diameters"). Support for claim 54 can be found on page 6, lines 13 – 14 ("may have widths of about ¼ to 3 inches"). Claims 55 and 56 are supported by the specification on page 6, lines 15 – 16 ("ellipses having minor axes of about ¼ to 2 and major axes ranging from about 3/8 to 3 inches"). The claims have been amended to conform "size" to its type of size or dimension, as clearly set forth in the specification. Based upon the examples provided within the specification, applicant submits that adequate support exists within the specification to support claim 48, as amended, and the new claims 53 – 56.

Claim 50 has been cancelled.

Based upon the amendment to claim 48, the deletion of claim 50, and the addition of claims 53 – 56, Applicant respectfully submits that all basis for the 35 U.S.C. §112, first paragraph rejections have been removed.

Response to 35 U.S.C. §112, Second Paragraph Rejection

Applicant has previously provided a clearer definition of a "trisoid," which was available to the public at the time that the parent provisional application was filed. Claim 48 has been amended to make clear what dimension was being referred to in this claim, namely the length of the filter units. Additionally, Claims 53 – 56 have been added to cover other configurations previously disclosed in the application. Claims 49 and 50 have been cancelled. Claims 48, 51, and 52 have been amended to provide for proper antecedent basis. The revisions to the claims and explanations should remove any basis for the 35 U.S.C. § 112, second paragraph rejections.

Response to 35 U.S.C. §102(b) Rejection

Claim 46 has been amended to narrow the scope of the claim to exclude embodiments with two or less openings. Hung requires that adequate thickness of the catalyzer material be available between the holes in the catalyzer (see page 9, lines 9 – 11 of the Hung patent). Hung also requires that its ribs be placed such that they do not lie over a hole, but overlap between the

holes (see page 9, lines 16 – 17 of the Hung patent). At least 1 mm thick catalyzer material is desired between and around the holes (see page 12, lines 2 – 3 of the Hung patent). These requirements limit the number of holes that can be used in the Hung catalyzer. Applicant respectfully submits that Hung does not disclose removing contaminants from an organic stream, as required in claim 47. The term "guard bed" can have various definitions. It does not necessarily mean "to filter." Guard beds can adsorb catalyst poisons, as is the case in U.S. Patent No. 6,096,278 to Gary, a copy of which the Examiner provided to the applicant. In Gary, the "guard bed" is not being used as a physical filter, it is being used as a chemical filter by selectively removing chemical contaminants that may poison the catalyst by adsorption. As noted in Column 4, lines 24 – 28 of the Gary patent, the guard bed removes halogenated species, acid gases, hydrocarbon vapors, and the like from the feedstream. These chemicals are adsorbed, not physically filtered. In Hung, there may be selective removal or initial reacting that occurs in the guard bed instead of filtering.

Guard beds can also be used as a pretreatment in chemical reactions, particularly with catalyst "guard beds." The attached U.S. Patent No. 6,297,417 to Samson uses the term "guard bed" to refer to a pretreatment bed (column 2, line 58 of the Samson patent). The pretreatment bed is used to contact a benzene feedstock with a solid acid to form a pretreated benzene feedstock (column 2, lines 20 – 24 of the Samson patent). Since the Hung patent discloses a catalyzer, and not a filtering medium as in the present invention, it is quite likely that Hung used the catalyzer in a "guard bed" to pretreat the feedstock prior to entering the remainder of the catalyst bed.

In the present application, the method being claimed is clearly that of physically filtering out contaminants. Contaminants are defined on page 16, lines 8 – 10 as "dirt, iron oxide, iron sulfide, asphaltenes, coke fines, catalyst fines, sediments or other entrained foreign particulate material." Several references to filtering solids can be found through out the application, such as on page 2, lines 11 – 12 ("method of filtering solids"), page 7, line 4 ("removing entrained solids"), and page 13, lines 1 – 2 ("improving the filtration of the solid particular matter from the feed streams").

One last distinction between the two inventions is that the Hung invention is used as a catalyzer for a particular process, specifically hydroprocessing. The instant invention method claims deal with fluid distribution and filtering, both of which can be used with any organic-feed stream. The present invention can be used in a much broader range of applications, as opposed to the very limited hydroprocessing process taught by the Hung patent. There is a significant difference between being a catalyst in a hydroprocessing reaction, since the catalyst is actually assisting in the reaction, and assisting in fluid distribution and filtering. With the instant invention, there is no chemical reaction between the ceramic filter units and the organic-feed stream. The ceramic filter units are used for mechanical purposes only, namely fluid distributing and filtering.

Claim 46 has been amended to narrow the number of openings to more than two openings. The Hung patent only discloses two openings in its catalyzer (p. 7, l. 18). In addition to amending claim 46, the Hung patent does not disclose removing contaminants from the feed stream and the present invention does. These differences make the present invention patentably distinguishable from the prior art reference, thereby removing the basis for the 35 U.S.C. 102(b) rejections for claims 46 and 47.

Claim 49 has been cancelled.

Claim 51 has been amended to only include grooves, as opposed to flutes. Flutes was originally defined in the application on page 6, lines 19 through 20 to include both flutes and grooves. The Hung patent only discloses ribs or flutes (see page 9, lines 13 through 15 of the Hung Patent). As amended, claim 51 is patentably distinguishable from Hung.

For these reasons, Applicant respectfully submits that Hung does not disclose filtering the feedstream, making claim 46 and all claims dependent therefrom patentably distinguishable from Hung.

To summarize the response to the 35 U.S.C § 102(b) rejections, (1) claim 46 has been amended; (2) applicant submits that the Hung patent does not disclose a filtering method; (3) claim 49 has been cancelled; and (4) claim 51 has been amended. For these reasons, Applicant respectfully submits that all basis for the §102(b) rejections have been removed.

Response to 35 U.S.C. § 103 Rejection

The Examiner rejected claims 48 and 50 under the provisions of 35 U.S.C. § 103(a) as being obvious in light of the Hung patent. The Hung patent teaches away from the limitations in claim 48, which eliminates this basis for the obviousness rejection for this claim. Claim 50 has been cancelled.

The Hung patent specifically discloses use of its catalyzer with diffusion limiting reactions. Reducing the pressure drop across the catalyst bed and increasing the catalyst efficiency are top priorities in hydroprocessing reactions. The Examiner states "that it would be obvious to one of ordinary skill in the art to have optimized the size of the unit according to a production method" (page 6, lines 7-9 of the Office Action). Applicant agrees that the size of the unit should be optimized according to a production method. However, since the Hung patent discloses a catalyzer, as opposed to a fluid distributor and filter, the size is much more important. Hung specifically teaches "that an increased catalyzer activity results in a reduced particle size" (page 6, lines 1 –2 of the Hung patent). The size of the particles in the present invention is larger than the size of the particles in the Hung patent. Since Hung desires smaller particles for increased catalyzer activity, then to say that sizes outside of what Hung claimed is also included is contrary to the teachings in Hung. Since the size is more important in Hung than in the present invention, it is likely that Hung only intended to claim what was specifically disclosed in its application and extending that range should be minimized.

Additionally, the Examiner suggests that the only difference between the Hung catalyzer and the present invention is the dimensions. This is not the case at all. As previously discussed, the Hung patent does not teach the method of fluid distribution or filtering that is claimed in the present invention.

Since the Hung patent teaches away from claim 48 and claim 50 has been cancelled, Applicant respectfully submits that the basis for the 35 U.S.C. § 103(a) rejections have been removed.

SUMMARY

Several substantial differences exist between the two inventions, making the presently claimed invention patentably distinguishable from the disclosure of the Hung patent. The methods for filtering and fluid distribution are very different, which is important to the performance of the instant invention. The shapes, sizes, and purposes of the two inventions are very different. Additionally, adequate support exists in the original application for the amendment to the existing claims and the new additional claims.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, Applicant reserves the right to submit additional evidence showing the distinctions between Applicant's invention to be unobvious in view of the prior art.

The foregoing remarks are intended to assist the Examiner in re-examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention which render it patentable, being only examples of certain advantageous features and differences which Applicant's attorney chooses to mention at this time.

Reconsideration of the application, as amended, and allowance of all of the claims are respectfully requested.

In view of the foregoing Amendment, Applicant respectfully submits that Claim 46 and all of the claims dependent thereon are allowable, and Applicant respectfully requests the issuance of a Notice of Allowance.

Respectfully submitted,

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Marked Up Version Showing Changes

46. (Twice amended) A method of fluid distribution in a chemical reactor comprising the steps of:

(a) providing a layer of ceramic filter units, at least some of the ceramic filter units having ~~a plurality of~~more than two openings extending therethrough, and at least some of the openings having a shape selected from the group consisting of ellipses and trisoids, at least some of the ceramic filters units having a plurality of flow passageways defined by the ~~plurality of~~ more than two openings extending through the ceramic filter units;

(b) contacting an organic-based feed stream with the layer of ceramic filter units; and

(c) subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through the plurality of flow passageways defined by the plurality of openings prior to the organic-based feed stream contacting a catalyst bed in the chemical reactor.

48. (Amended) The method of fluid distribution of claim 47, including ~~the~~ a step of utilizing ceramic filter units having a ~~size~~ length of 0.5 inches to 3 inches.

51. (Amended) The method of fluid distribution of claim 47, including ~~the~~ a step of utilizing ceramic filter units having ~~a fluted surface~~at least one groove on a periphery surface of the ceramic filter units.

52. (Amended) The method of fluid distribution of claim 47, including ~~the~~ a step of utilizing ceramic filter units having a polygonal cross-sectional configuration having a plurality of sides, the configuration selected from the group consisting of triangles, quadrilaterals, squares, rectangles, pentagons, hexagons, heptagons, and octagons.